# Midterm 1 test Correction

**Level: 1st Year** **Date : 27 / 11 /2024**

**Material: Network Foundation 1** **Duration :1h 30min**

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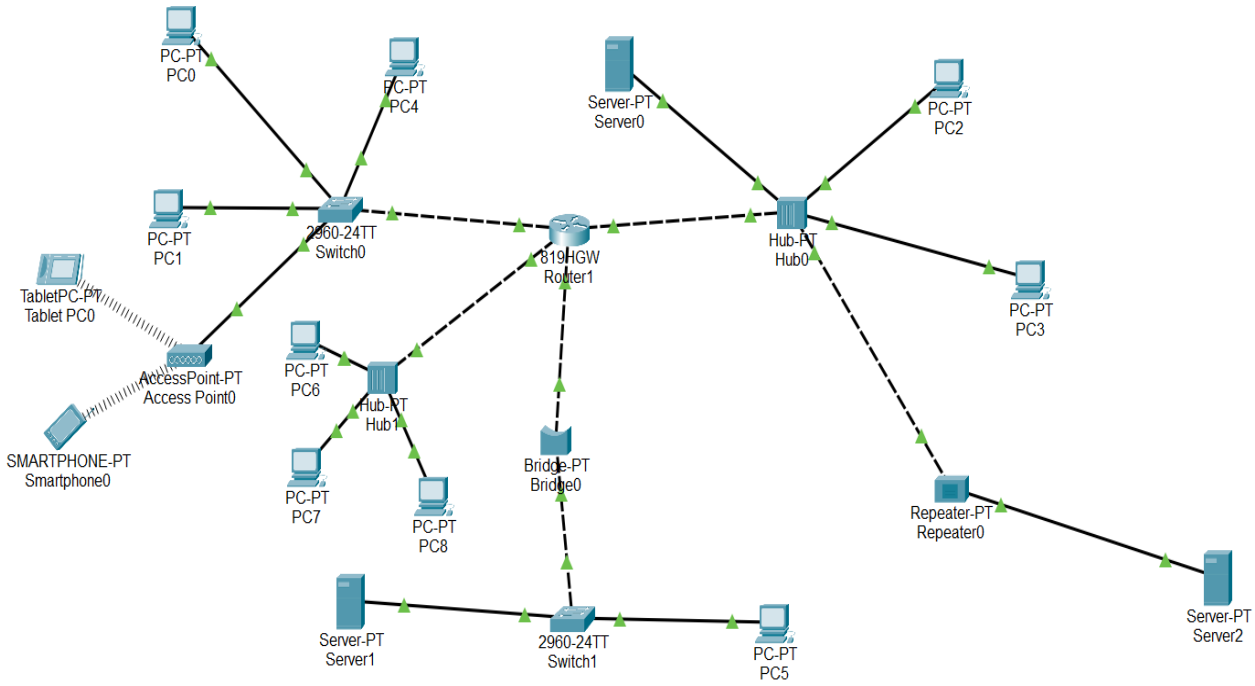
## Part 2: Exercice 01 (07 points)

Given the network given bellow




What are the OSI model layer(s) and the TCP/IP model layers that exist in each device.

| OSI MODEL | TCP/IP | DEVICE |
|---|---|---|
| Application | Application | PC,SERVER,Tablet,SmartPhone |
| Presentation | | |
| Session | | |
| Transport | Transport | |
| Network | Internet | Router |
| Data link | Network Access | Bridge,Switch |
| Physical | | Hub,Repeater |

1. How many collision domains are there in the diagram?

11

2. How many broadcast domains are there in the diagram?

4

3. Explain the path of the packets in the following cases:

**a.** When Machine "PC0" wants to communicate with Machine "Server1".

PC0 sends the packet to switch0 with @Mac Dest of Router1 and @IP of Server 1, then switch0 transmit it directly into the Router1 if the @MAC Dest of the packet corresponds to an entry of Switch0 MAC TABLE otherwise, switch0 broadcast it to all the connected devices. Next, Router1 checks its Routing table and forward the packet into Bridge0. The bridge0 forwards the packet into Switch1 and finally, Switch1 send the packet directly into Server1 if the @MAC dest of the packet corresponds to an entry of Switch1 MAC TABLE otherwise, Switch1 broadcast the packet to all connected devices.

**b.** When "Tablet" wants to communicate with Machine "Server 1".

Tablet sends the packet to AP0 with @Mac Dest of Router1 and @IP of Server 1 , then AP0 broadcast it to all the connected devices. Next, Switch0 forward the Packet into Router1 that checks its Routing table to forward the packet into Bridge0 . The bridge0 forwards the packet into Switch1 and finally, Switch1 send the packet directly into Server1

**d.** When "PC7" wants to communicate with Machine "Smartphone".

PC7 sends the packet with @MAC dest of Router1 and @IP of Smartphone to Hub1, the Hub1 broadcast the packet to all the connected devices , then the Router1 receives the packet and forward it to Switch0 according to its Routing table ,after that Switch0 receives the the packet and transmit it to AP0 and finally AP0 broadcast the packet to all the devices .

4. Provide the PDU format (headers) at each layer of the OSI model in the case when user 1 of PC0 with Mac address of 00–01–4B-B4-A2-FF and IP address of 192.168.1.16 try to send voice packet to web server.

| | |
|---|---|
| Application | Chat App ,protocol :http or https |
| Presentation | Voice format |
| Session | User1 |
| Transport(Segment) | Port:80 |
| Network (Packet) | 192.168.1.16, ip dest server |
| Data link (Frame) | 00–01–4B-B4-A2-FF, mac dest router |
| Physical | Wireless or cable or binary suit |

5. If the "bridge0" is replaced with a Router, recalculate the new collision and broadcast domains.

Broadcast Domain: 5

Collision domain :11

## Exercise2: (06 points)

1. Recall the role of application server in 3 tiers architecture.

Process clients query and send them to Database server
Get data from Database Server and transmit them to clients
Reduce overload
Perform calculation and processing

2. What are differences between repeater and switch

Repeater Physical layer and Switch Data link layer
Repeater amplifies the received data to all the devices and Switch use MAC TABLE to transmit the data directly to the destination

3. What is the Difference between client/server and p2P architecture?

P2P :clients request data and provide services to other clients
Client/server : clients always send requests and the server provides the services

4. Cite the advantages of connectionless connection mode compared to connection-oriented mode.

It is faster because Sending data doesn't requires establishing a connection first.
Scalability and less complicated
Does not congest the bandwidth

5. Which OSI layer that is responsible for encryption?

Presentation layer

6. Give the difference between Serial/ parallel communication

Serial: slower, more reliable and used for long distance communication like USB cable.

Parallel: faster, sometimes occurs errors, used for short distances like internal buses.

7. Employees in a company are capable of downloading films over internet

what is connection mode in this case? Explain?

The connection mode is Connection-Oriented. The connection-oriented mode establishes a persistent and reliable connection between the source (server) and the destination (employee's device) before transmitting data. Because of

- Reliability: (When downloading films, the data (film file) must be received in its entirety and in the correct sequence).
- Connection-Oriented mode ensures that all packets are delivered without loss, error, or duplication by retransmitting any lost packets and maintaining the order of data.
- Connection-Oriented mode operates with acknowledgments (ACKs) for data delivery, ensuring that the sender knows the data was successfully received.
- Most internet downloads, including films, use the HTTP or HTTPS protocols, which run on top of TCP. This makes it connection-oriented by design.

8. what type of switching is used in this case? why?

Packet switching because the communication is done via internet

It is more suitable compared to circuit switching and message switching